

ĀRYABHAṬA : HIS NAME, TIME AND PROVENANCE

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Āryabhata is one of the eminent astronomers of early India. Of late there is a tendency to spell his name as "Āryabhata". While Āryabhata himself mentions Kali 3600 to be the date of his composing the work, some say that Kali 3600 is the date of his birth. A view has been broached that Āryabhata hailed from Kerala. These points have been discussed and an effort has been made in this paper to arrive at the correct position in these matters.

Keywords: Āryabhata, Āsmaka, Kusumapura, Pataliputra

Āryabhata is acknowledged as one of the astute astronomers of early India. His school of astronomy is well known and widespread all over India, especially in the South. However, differing voices are heard about his name, date and provenance. An attempt is made herein below to examine these matters and set things right.

I. THE NAME OF THE ASTRONOMER : IS ĀRYABHATA OR ĀRYABHATA?

Of late, there has been a tendency to spell the name as "Āryabhata" with the suffix "bhata". Two artificial satellites sent up into space by Indian scientists are given the names "Āryabhata I" and "Āryabhata II". Some modern writers also make use of this spelling. But, is the spelling of the astronomer's name with the suffix "bhata" correct?

Now, it is to be noted that no astronomical text spells the name as

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“Āryabhaṭṭa”. The author himself mentions his name at three places only as “Āryabhata”, towards the beginning and ending verses of his work *Āryabhaṭīya*.¹

pranīpatyaikam anekam kaṃ satyām devataṃ paraṃ brahma /
Āryabhaṭas trīṇi gadati gaṇitaṃ kālakriyām golam //
(*Āryabhaṭīya*, *Gītikāpāda*, verse 1)

brahma-ku-śaśi-budha-bhṛgu-
kuja-guru-koṇa-bhagaṇān namaskṛtya /
Āryabhaṭas tviha nigadati
Kusumapure 'bhycitāṃ jñānam //
(*Gaṇitapāda*, verse 1)

Āryabhaṭīyaṃ nāmnā
pūruvaṃ svāyambhuvam sadā satyam /
sukṛtāyusoḥ praṇāśam
kurute pratikañcukam yo 'sya //
(*Golapāda*, verse 50)

Our author's younger contemporary, Varāhamihira, too, mentions the name only as Āryabhata and that too in a verse which forecloses the form “Āryabhaṭṭa”. Thus, while speaking of the two ways of reckoning the day, viz., from midnight and from sunrise, propounded by our author, Varāhamihira says in his *Pañcasiddhantikā* (XV. 20):

laṅkārdharātrasamaye
dinapravṛttiṃ jagāda cāryabhaṭaḥ /
bhūyah sa eva sūryo-
dayāt prabhṛty āha laṅkayām //

In his commentary on *Āryabhaṭīya*, Bhāskara I, an ardent follower of our author, mentions the author's name only as Āryabhata whenever the latter is mentioned during the course of the commentary. The concluding verse of the commentary too mentions the name only as Āryabhata²:

¹ *Āryabhaṭīya of Āryabhaṭa*, Cr. Edn. & Tr. by K. S. Shukla and K. V. Sarma, Indian National Science Academy, New Delhi, 1976.

² *Āryabhaṭīya of Āryabhaṭa with the Commentary of Bhāskarācārya and Someśvara*, ed. by K. S. Shukla, Indian National Science Academy, New Delhi, 1976, p. 88.

*atīndriyārṭhapratipādakāni
sūtrāny amūny Āryabhaṭoditāni /
tesām aśakyo 'rthaśatāmaśako 'pi
vaktum kuto 'smatsadṛśair aśeṣam //*

Brahmagupta (6th cent. AD), contemporary of Bhāskara I, mentions Āryabhaṭa at the beginning verse of his *Khaṇḍakhādyaka* (1.11):

*praṇipatya mahādevaṃ
jagadutpattisthitipralayahetum /
vaksyāmi khaṇḍakhādyakam
ācāryāryabhaṭatulyaphalam //*

Someśvara, another early commentator (c. 1000 AD) on the *Āryabhaṭīya*, too, spells the name of our author only as Āryabhaṭa in the concluding verse of his commentary:

*spaṣṭārṭhapratibodhakam mṛdudhiyām sūktam prabodhapradam
tarkavyākaraṇādīśuddhamatinā Someśvareṇādhunā /
Acāryāryabhaṭokta sūtravivṛtir yā Bhāskarotpāditā
tasyāḥ sāratarām vikṛṣya racitam bhāṣyam prakṛṣṭam laghu //*

In the same vein Sūryadeva Yajvan (c. 1000 AD), hailing from Tamilnadu, closes his commentary on *Āryabhaṭīya* with the verse

*triskandhārthavidā samyak Sūryadevena Yajvanā /
saṅkṣipyāryabhaṭaproktasūtrārtho 'tra prakāśyate //*

(Com. on *Golapāda*, verse 50)

Śaṅkaranārāyaṇa, the court-astronomer of the Kerala king Ravivarma of the 8th century, commences his commentary of the *Laghubhāskarīya* of Bhāskara I with the verse:

*Ācāryāryabhaṭam Varāhamihiram
Śrīmadgurum Bhāskaram /
Govindam Haridattam atra śirasā
vaksye praṇamya kramāt //*

Gārgya-Kerala-Nilakaṇṭha Somayāji commences his commentary on the

Āryabhaṭīya with the verse:

*bhagavantam cāryabhaṭam
natvā vyākhyāyate 'tha tattantram /*

The Kerala commentator Ghaṭīgopa's commentary commences with the verse:

*gajānanam ca vānīm ca śrī-sūryādīn grahān api /
pūrvācāryāṃś cāryabhaṭapramukhān praṇato 'smy aham //*

It is to be noted that in all the above cases the name of our author is spelt only as "Āryabhaṭa" and not "Āryabhaṭṭa" and that the latter form will revolt against the metre.

It should be obvious from the above that the correct name of our author is only "Āryabhaṭa" and that the modern tendency to revise the name to "Āryabhaṭṭa" is not warranted.

II. DATE OF ĀRYABHAṬA

Propitiously enough, Āryabhaṭa himself gives a clue to his date in his *Āryabhaṭīya*, *Kālakriyāpāda*, verse 10, which reads :

*ṣaṣṭyabdānām ṣaṣṭir yadā
vyatītās trayas ca yugapādāḥ /
tryadhikā viṃsatir abdās
tadeha mama janmano 'tītāḥ //*

"When sixty times sixty years and three quarter *yugas* (of the current *yuga*) had elapsed, twenty three years had then passed since my birth."

The stanza states that at the time of composing the work $60 \times 60 = 3600$ years of the Kaliyuga had elapsed and, incidentally, the author adds that it was then 23 years after his birth. The date works out to the end of the Kali year 3600, corresponding to the Śaka year 421, the date being March 21, 499. The position of the equinoxes were then zero degree and so the mean positions of the planets would be accurate if computed using their parameters given by the author in the *Gītikāpāda* of the *Āryabhaṭīya*.³

For computation of the mean planetary positions for future dates, a small correction was to be applied, which Āryabhaṭa's follower Lallācārya gives in his work *Śisyadhivṛddhida*.⁴

While most commentators follow the above interpretation, in Kerala, the Parahita system enunciated by Haridatta in 689 AD interprets the verse to mean that the date given in the verse is the date of birth of Āryabhaṭa and not the date of the composition of the work. "When sixty times sixty years and three *yugas* had elapsed, twentythree years of my age have passed since then."

This would mean that Āryabhaṭa was born in Kali 3600, equivalent to Śaka 421 or AD 499, and that he composed the *Āryabhaṭīya* when he was 25 years old, i.e. in Śaka 444 or AD 522. But the parameters of *Āryabhaṭīya* accord only with the year Kali 3600. For this reason, in the Parahita system corrections for computing the mean longitudes of planets using Āryabhaṭa's parameters but with the epoch of Śaka 444 have been evolved for use in astronomical computations.⁵

III. AŚMAKA : ĀRYABHATA'S PROVENANCE

Āryabhaṭa does not make any specific mention of the place or country of his birth but this omission is filled by Bhāskara I, his follower and commentator, who is, perhaps, the best authority in the matter on account of his chronological proximity, besides being the propagator of the *Āryabhaṭīya* school.

Bhāskara I who hailed from southern Gujarat, as evidenced from references in his commentary on the *Āryabhaṭīya*, calls himself as *Āśmakīya*, "one belonging to the Aśmaka country". He also specifies that Āryabhaṭa too was an *Āśmakīya*, for which reason his work was called *Aśmakatantra*.

³ *Āryabhaṭīya of Āryabhaṭa*, Cr. Edn. & Tr., p. 96.

⁴ *Śisyadhivṛddhida* with the commentary of Mallikārjuna Sūri, ed. by Bina Chatterji, Indian National Science Academy, New Delhi 1981.

⁵ See *Āryabhaṭīya*, Cr. Edn. & Tr., p. 97.

Nilakaṇṭha Somayāji states specifically in his commentary on *Āryabhaṭīya* (*Gaṇitapāda*, verse 1): *Āsmakajanapadaajāta Āryabhaṭācāryah*, “Aryabhaṭa born in the Āsmaka country.”

The Āsmaka country was situated, according to Varāhamihira (*Bṛhatsamhita*, XIV. 22), the *Rāmāyana* and the *Mahābhārata*, in the North-West of India. According to the Buddhist text *Dīghanikāya* (XIX. 36), during the time of the Buddha a branch of the Āsmaka people moved to the South and settled in the modern South Gujarat-North Maharashtra region, on the banks of the rivers Godāvārī and Narmadā. Several texts, both Buddhist and Hindu, attest to this fact. Obviously, Āryabhaṭa hailed from this region and naturally came to be known as Āsmakīya.⁶

Of late, a quaint suggestion has been made to the effect that Kerala could have been the country of birth of Āryabhaṭa for two reasons. The first one is that the word *Āsmaka*, which, in Sanskrit, means “stone”, could be related to Koṭuṅṅallūr in Central Kerala, which, during early times, was one of the capital cities of the land and a centre of learning. It is stated that its present name could be a derivative of the word Koṭum-Kal-l-ūr, meaning “a city of hard stones”, since in Malayalam *koṭu* means hard and *kal* means stone. This is linguistically possible, but the incompatibility arises from the fact that old records show that, during ancient times, the city was known as Koṭum-kol-ūr, “the city of strict governance”. Naturally enough, the harsher pronouncing word Koṭum-kol-ūr slipped into the more easily pronounced word Koṭuṅṅallūr. That the said ancient name of the city occurs in certain early texts has been noticed by the veteran litterateur and researcher, the late Ulloor S. Parameswara Aiyer, in his article “Kuṇavāyirkoṭṭam and Vañci”, (*K.V. Rangaswami Aiyangar Commemoration Volume*, Madras, 1940, pp. 241-51). Identifying this with Vañci, the capital

⁶. For detailed references see : *Varāhamihira's Bṛhatsamhitā*, Ed., & Tr. by M. Ramakrishna Bhat, Motilal Banarsidass, Delhi, 1981, pt. I, pp. 177-78; J. F. Fleet, *The Topographical List of Brihat Samhita*, ed. K. K. Das Gupta, Semushi, Calcutta, 1973, p. 20; K. D. Bajpai, *The Geographical Encyclopaedia of Ancient and Medieval India*, Indic Academy, Varanasi, 1967, pp. 35-36, *Āryabhaṭīya*, Cr. Edn. by K. S. Shukla and K. V. Sarma, op. cit., Introduction, pp. xxix-xxx.

of the Cera kings of Kerala, he quotes two passages from early texts wherein the name of the city is spelt only as Kotumkolūr and not Koṭumkallūr. Quoting from a 12-13th century Sanskrit-Tamil work in *Manipravālam* style, he states :

*Kollaviblūtīm kollum vibhavā nūru maṭaṇṇu 'Koṭunṇolūrilum'
ere vilaṇṇina paṇṭupayātā Kuṇavāyakkuram api kuṇapam dadhatī.*

“It will be seen that the author begins from the south, and touches Kollam (present-day Quilon), Koṭunṇolur (Koṭumkolūr, the modern Koṭunṇallūr, whose anglicised form is Cranganore), Kuṇavāy etc.” (p. 242).

Later in the same article (p. 246) he refers to the occurrence of the name of the city, again, as Koṭuṅkolūr. Further he refers to the early Tamil classic *Cilappatikāram* and quotes from Aṭiyākkunallār, the commentator of that classic: “*Kuṇram, Koṭuṅkolūrkku ayalatākiya Ceṅkunrenum malai.*” (p. 246, fn. 13).

It should be amply clear from the above-given references that during the time of Āryabhaṭa (c. AD 500), which is the time also of *Cilappatikāram*, and, later too, the city was known only as Koṭumkolūr (“the city of stern rule”) and not Koṭumkallūr (“the city of hard stones”), to give it any possibility of being equated with Aśmaka.

The non-feasibility of Kerala being the Aśmaka region is strengthened by the fact that nowhere in the two works of Āryabhaṭa, viz., *Āryabhaṭīya* and the *Āryabhaṭasiddhānta*, Kerala has been referred to. More telling is the fact that Āryabhaṭa has concocted an extremely inconvenient system of letter-numerals which he would not have done had he been aware of the facile letter-numeral system of *Kaṭapayādi* which was prevalent in Kerala even before the time of Āryabhaṭa. It might also be noted that even the names of the three known disciples of Āryabhaṭa, Pāṇḍuraṅgasvāmi, Niśaṅku and Lāṭadeva do not have any semblance of Keralite personal names, old or new.

Equally fragile is the second reason adduced, viz., that Āryabhaṭa should have hailed from Kerala since, besides the Āryabhaṭan system being prevalent in this land, “all” commentaries on *Āryabhaṭīya* have been produced by

Kerala astronomers. This argument really does not stand scrutiny. For one thing, though the *Āryabhaṭīya* and works on its basis are widely prevalent in Kerala, the second work of Āryabhaṭa, viz., *Āryabhaṭasiddhānta* is not known in Kerala at all. The prevalence of *Āryabhaṭīya* also outside Kerala is vouched by the fact of its being studied and commentaries thereof produced elsewhere as well, both in Sanskrit and in the regional languages. Among the non-Keralite commentators and commentaries and works based on the *Āryabhaṭīya* the following may be mentioned:⁷

NON-KERALITE COMMENTATORS IN SANSKRIT

1. Prabhākara (c. 525 AD)
2. Bhāskara I (629 AD) of Valabhī in Gujarat.
3. Someśvara (c. 968-1200) of Gujarat.
4. Sūryadeva Yajvan (1191 AD) of Gangaikonda-colapuram in Tamilnadu.
5. Yallaya (*fl.* 1482) of Skandasomeśvara in Telugu country.
6. Raghunātharāja (1597) of Ahobilam in Karnataka.
7. Mādhava, son of Virūpākṣa, of Andhra Pradesh.
8. Bhūtiviṣṇu, son of Devarāja, of Kāñcīpuram in Tamilnadu.
9. Kodaṇḍarāma (1807-93) of Andhra Pradesh.

COMMENTATORS IN TELUGU

10. Virūpākṣa Sūri of Andhra Pradesh.
11. Kodaṇḍarāma (1807-83) of Andhra Pradesh who wrote a commentary in Sanskrit also.

COMMENTATOR/TRANSLATOR IN MARATHI

12. Anonymous Ms. in the Bombay University Library, No. 334.

⁷. Vide *Āryabhaṭīya*, Cr. Edn. & Tr., Introduction., pp. xxxv-xxii.

WORKS PRODUCED OUTSIDE KERALA, BASED IN THE ĀRYABHAṬĪYA

13. Bhāskara I, *Mahāhāskarīya*
14. Bhāskara I, *Laghubhāskarīya*
15. Lalla, *Śiṣyadhīvrddhida*
16. Brahmadeva (1092 AD), *Karaṇaprakāśa*
17. Dāmodara (1400 AD), *Bhaṭatulya*
18. Vīrasimhagaṇaka, son of Kāśiraja, *Āryasiddhāntatulyakaraṇa*

TRANSLATOR IN ARABIC

19. Abul Hasan Ahwazi under the Caliphate in Baghdad.

It is also to be noted that the second work of Āryabhaṭa, viz., *Āryasiddhānta*, is completely unknown in Kerala while it has influenced astronomical writings in Andhra Pradesh, Northwest India, Iran and the early Abbasid Caliphate.

In view of the above massive evidence, any claim that the study of *Āryabhaṭīya* was carried on and that commentaries were written only in Kerala, and therefore Āryabhaṭa hailed from Kerala, loses all credibility.

KUSUMAPURA WHERE ĀRYABHAṬA FLOURISHED

Āryabhaṭa states in the *Āryabhaṭīya* (*Gaṇitapāda*, verse 1) that he was setting forth in his work the knowledge that had been honoured in Kusumapura. The following verse specifies that at a time when the results computed through the then prevailing five astronomical schools (*siddhāntas*) (viz., Vāsiṣṭha, Paitāmaha, Pauliśa, Romaka and Saura gave conflicting results, Āryabhaṭa, as the head of an institution (*kulapa*), set forth his modified system of astronomical computation in Kusumapura:

*siddhāta-pañcakavidhāv api drgviruddha-
maudhyoparāgamukha-khecaracārakṣptau /
sūryaḥ swayam Kusumapury abhavad kalau tu
bhūgolavit kulapa Āryabhaṭābhidhānaḥ //*

“When the methods of the five Siddhāntas began to yield results conflicting with the observed results as in the case of setting of the planets, eclipses etc., there appeared in the Kali age, at Kusumapura, God Sun himself in the form of Āryabhaṭa, the *Kulapa* (‘head of an institution’) well versed in astronomy.”

In spite of the well-known identification of Kusumapura with Pāṭaliputra (modern Patna), the capital of the ancient Magadha country (Bihar), suggestions have been hazarded that if the Aśmaka country could be identified as Kerala, Kusumapura can be identified with the township of Pūnkunnam near Trichur and if Aśmaka could be the same as Tamilnadu, Kusumapura can be identified with Pūmpuhār on the east coast. The puerile nature and far-fetchedness of both these suggestions would be obvious when it is noted that they do not conform even to the literal meaning of Kusumapura, “flower city”, since the two suggested words mean only “flower hill” and “flower river-mouth”. There is neither an astronomical tradition nor such an institution in these two places, to sustain the epithet of *Kulapa* given to Āryabhaṭa.

Indian tradition, Hindu and Buddhists, Purāṇic and historical, is loud and clear in identifying Kusumapura with Pāṭaliputra, the capital of Magadha. In fact, Āryabhaṭa’s follower Bhāskara I himself states in his commentary on the *Āryabhaṭīya* that Kusumapura is Pāṭaliputra. Thus, in his commentary on *Āryabhaṭīya* (*Gaṇitapāda*, verse 1), he explains “*Kusumapure ’bhyarcitam jñānam. Kusumapuram Pāṭaliputram.*” The Sanskrit lexicons offer also alternate forms for both the names, viz., Kusumapura in Hemacandra’s *Abhidhānacintāmaṇi* (133.976) and Puṣpapura in Keśava’s *Kalpadrukośa* (10.18), Pāṭaliputra in the *Abhidhānacintāmaṇi* (133.976), Pāṭaliputraka in Puruṣottama’s *Trikāṇḍaśeṣa* and Pura in Hemacandra’s *Anekārthasaṅgraha* (36.450).⁹

⁸ David Pingree, *Census of Exact Sciences in India*, Philadelphia, Ser. A. Vol. I, 1970, p. 50.

⁹ See M. M. Patkar, “Geographical Data in Sanskrit Lexicons,” *Bulletin of the Deccan College Research Institute*, 14.4 (March 1953) 249-305.

CONCLUSION

What has been stated above would show that Āryabhaṭa hailed from the Aśmaka country, which comprised the present South Gujarat and North Maharashtra, through which the rivers Godāvārī and Narmadā flowed. He flourished at Pāṭaliputra (modern Patna) in the ancient Magadha country (now Bihar) where he composed his works, the *Āryabhaṭīya* and *Āryabhaṭasiddhānta*. It may be recalled that the reputed University of Nalanda was situated at Pāṭaliputra and had an astronomical observatory (*Kha-gola*) attached to it.¹⁰ Āryabhaṭa who has been described as a *Kulapa* (“head of institution”) could well have also been the head of the Nalanda University.

¹⁰. Vide D. G. Apte, *Universities of Ancient India*, Baroda, p. 30. See also, Kripa Shankar Shukla, *Aryabhaṭa : Indian Mathematician and Astronomer* (5th century A.D.) New Delhi 1976.